NEW ENGLAND
COMMON ASSESSMENT PROGRAM

Released Items
Support Materials
2007

Grade 4
Mathematics

> **N&O 3.1** **Demonstrates conceptual understanding of rational numbers with respect to: whole numbers** <u>from 0 to 999</u> through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: *a*/2, *a*/3, *a*/4, <u>*a*/6</u>, or <u>*a*/8</u>, where *a* is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area and set models where the number of parts in the whole is equal to the denominator; and **decimals** <u>(within a context of money) as a part of 100</u> **using models, explanations, or other representations.**

1 Which number sentence is true?

- ○ A. $100 + 85 = 10 + 85$
- ○ B. $100 + 85 = 150 + 8$
- ○ C. $100 + 85 = 105 + 80$
- ○ D. $100 + 85 = 108 + 5$

N&O 3.2 **Demonstrates understanding of the relative magnitude of numbers** <u>from 0 to 999</u> by ordering whole numbers; by comparing whole numbers to benchmark whole numbers (100, <u>250</u>, <u>500</u>, <u>or 750</u>); or by <u>comparing whole numbers to each other</u>; and <u>comparing or identifying equivalent positive fractional numbers</u> (*a*/2, *a*/3, *a*/4 where *a* is a whole number greater than 0 and less than or equal to the denominator) using models, number lines, or explanations.

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2 This chart shows how many stars some classes earned.

Stars Earned by Classes

Teacher	Number of Stars
Mr. Hogan	750
Mrs. Lee	?
Ms. Walsh	500

Mrs. Lee's class earned **fewer** stars than Mr. Hogan's class and **more** stars than Ms. Walsh's class. Which number could be the number of stars Mrs. Lee's class earned?

○ A. 430
○ B. 680
○ C. 800
○ D. 1250

N&O 3.2	**Demonstrates understanding of the relative magnitude of numbers** <u>from 0 to 999</u> by ordering whole numbers; by comparing whole numbers to benchmark whole numbers (100, <u>250</u>, <u>500</u>, <u>or 750</u>); or by <u>comparing whole numbers to each other</u>; and <u>comparing or identifying equivalent positive fractional numbers</u> (*a*/2, *a*/3, *a*/4 where *a* is a whole number greater than 0 and less than or equal to the denominator) using models, number lines, or explanations.

3 Seth has 3 one-dollar bills and 12 dimes. Tim has $4.02. Which statement is true?

○ A. Seth has more money than Tim.

○ B. Seth has less money than Tim.

○ C. Seth and Tim have the same amount of money.

N&O 3.3 **Demonstrates conceptual understanding of mathematical operations** <u>by describing or illustrating the</u> <u>inverse relationship between addition and subtraction of whole numbers</u>; and <u>the relationship between</u> <u>repeated addition and multiplication using models, number lines, or explanations</u>.

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4 The students in Mr. Hill's class are solving this problem.

> Peter had 10 pennies. Then he found more pennies.
>
> Now Peter has 16 pennies. How many pennies did Peter find?

Three students wrote these number sentences to solve the problem.

$$16 - 10 = \square \qquad 10 - \square = 16 \qquad 10 + \square = 16$$
Ella **Connie** **Andy**

Who wrote a correct number sentence?

- ○ A. only Connie and Andy
- ○ B. only Connie
- ○ C. only Andy and Ella
- ○ D. only Ella

N&O 3.4 **Accurately solves problems involving** addition and subtraction with and without regrouping; the concept of multiplication; and addition or subtraction of decimals (in the context of money).

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5 This chart shows how many miles long the Appalachian Trail is in three states.

Appalachian Trail

State	Miles Long
Maine	281
New Hampshire	161
Vermont	150

How many miles of the Appalachian Trail are in these three states?

- ○ A. 311
- ○ B. 442
- ○ C. 492
- ○ D. 592

G&M 3.1 <u>**Uses properties or attributes of angles**</u> (number of angles) <u>**or sides**</u> (number of sides or length of sides) or composition or decomposition of shapes <u>**to identify, describe, or distinguish among**</u> triangles, squares, rectangles, rhombi, trapezoids, hexagons, or circles.

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6 Which statement is true?

○ A. One line segment can divide a triangle into two smaller triangles.

○ B. One line segment can divide a square into two smaller squares.

○ C. One line segment can divide a circle into two smaller circles.

○ D. One line segment can divide a hexagon into two smaller hexagons.

G&M 3.6 **Demonstrates conceptual understanding of perimeter of** polygons, and **the area of** rectangles <u>on grids</u> using a variety of models or manipulatives. <u>Expresses all measures using appropriate units</u>.

7 This is a model of the ceiling in Ted's room.
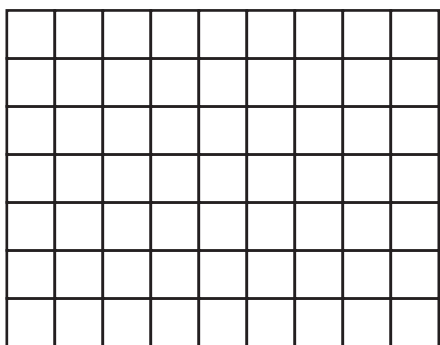
Key

⬜ represents 1 square foot

How many square-foot tiles does Ted need to cover the ceiling?

○ A. 63
○ B. 54
○ C. 32
○ D. 28

F&A 3.4   **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions using models or different representations of the expressions; or by finding the value that will make an open sentence true (e.g., $2 + \square = 7$). (limited to one operation and limited to use addition, subtraction, or multiplication)

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8 Cole wants to balance this scale.
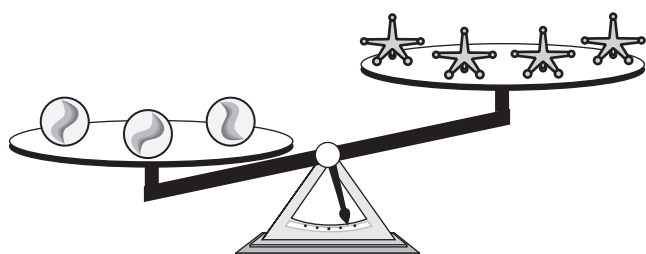
He knows one ⬤ weighs the same as four ✦. How many **more** ✦ should Cole put on the right side of the scale to balance it?

- ○ A.   2
- ○ B.   4
- ○ C.   8
- ○ D. 10

DSP 3.2	Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using most frequent (mode), least frequent, largest, or smallest.

9 Ben asked 26 students what their favorite sport was. He made this tally chart.

Favorite Sports

Sport	Number of Votes
Soccer	卌 |||
Hockey	|||
Baseball	卌 ||
Basketball	卌	
Volleyball	||

Then 3 students changed their votes from soccer to hockey.

What sport has the most votes now?

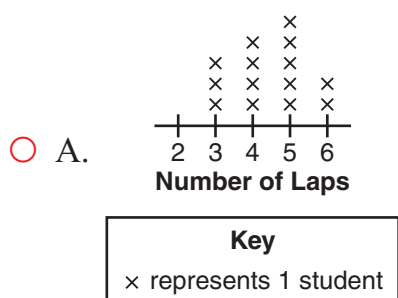○ A. soccer
○ B. hockey
○ C. baseball
○ D. basketball

DSP 3.3 **Identifies or describes representations or elements of representations that best display a given set of data or situation**, consistent with the representations required in M(DSP)–3–1.

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10 Claudia made a line plot to show how many laps students in her class ran around a track.

- The greatest number of laps a student ran was 6.
- The fewest number of laps a student ran was 2.

Which line plot could Claudia have made?

○ A.

```
          ×
      ×   ×   ×
  ×   ×   ×   ×
  ×   ×   ×   ×   ×
  ×   ×   ×   ×   ×
  +---+---+---+---+---+
  2   3   4   5   6
```
Number of Laps

Key
× represents 1 student

○ C.

```
          ×
      ×   ×   ×
  ×   ×   ×   ×   ×   ×
  +---+---+---+---+---+---+
  1   2   3   4   5   6
```
Number of Laps

Key
× represents 1 student

○ B.

```
          ×
          ×
          ×
  ×       ×       ×
  ×       ×       ×   ×
  ×       ×       ×   ×
  +---+---+---+---+---+---+
  2   3   4   5   6   7
```
Number of Laps

Key
× represents 1 student

○ D.

```
          ×
          ×
      ×   ×   ×
  ×   ×   ×   ×   ×
  ×   ×   ×   ×   ×
  +---+---+---+---+---+
  2   3   4   5   6
```
Number of Laps

Key
× represents 1 student

> **N&O 3.1** **Demonstrates conceptual understanding of rational numbers with respect to: whole numbers** <u>from</u> <u>0 to 999</u> through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: *a/*2, *a/*3, *a/*4, <u>*a/*6</u>, or <u>*a/*8</u>, where *a* is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area and set models where the number of parts in the whole is equal to the denominator; and <u>**decimals** (within a context of money) as a part of 100</u> **using models, explanations, or other representations.**

11 Each child picked two toys from this set of toys.
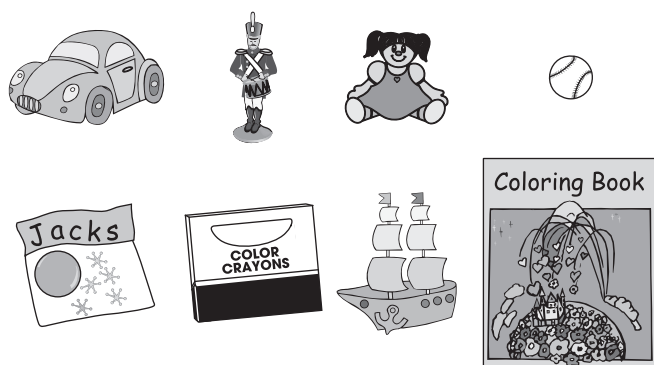
Travis picked the and the .

Pat picked the and the .

Jerry picked the and the .

What **fraction** of the set of toys is left over?
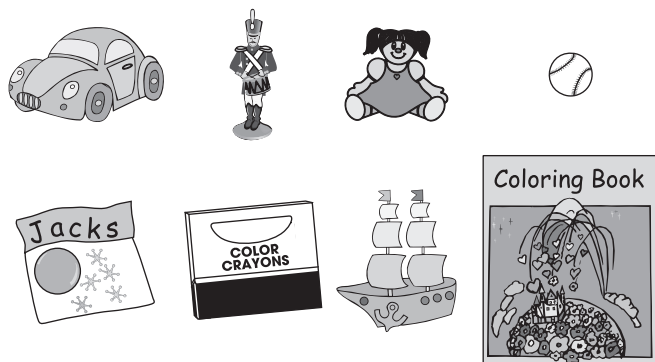
Scoring Guide

Score	Description
1	Student writes a correct fraction, $\frac{2}{8}$ **or equivalent**.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Note: A response of 2 out of 8 receives no credit; a response of two-eighths receives credit.

SCORE POINT 1
(EXAMPLE A)

⓫ Each child picked two toys from this set of toys.

Travis picked the [ship] and the [soldier].

Pat picked the [doll] and the [Jacks].

Jerry picked the [COLOR CRAYONS] and the [Coloring Book].

What **fraction** of the set of toys is left over?

$$\frac{2}{8}$$ ——— Student's answer is correct.

SCORE POINT 0
(EXAMPLE A)

⓫ Each child picked two toys from this set of toys.

Travis picked the [ship] and the [toy soldier].

Pat picked the [doll] and the [Jacks].

Jerry picked the [color crayons] and the [coloring book].
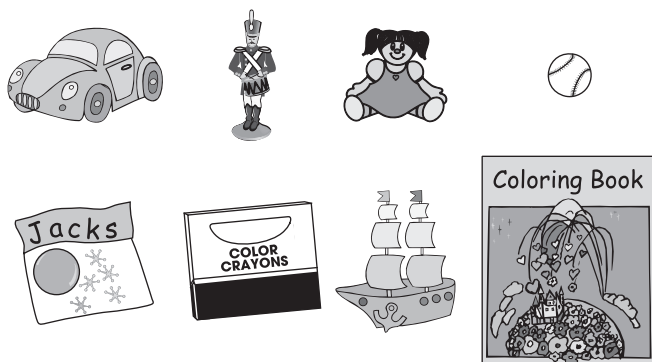
What **fraction** of the set of toys is left over?

thecar, baseball are left

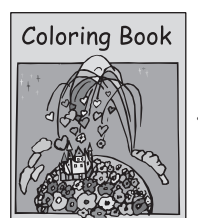Student's answer is not written as a fraction.

SCORE POINT 0
(EXAMPLE B)

11 Each child picked two toys from this set of toys.

Travis picked the and the .

Pat picked the and the .

Jerry picked the and the .

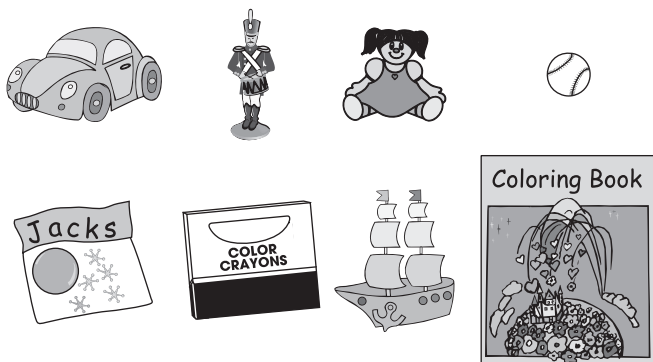What **fraction** of the set of toys is left over?

$$\frac{2}{6}$$

Student's answer is incorrect.

N&O 3.4	**Accurately solves problems involving** addition and subtraction with and without regrouping; the concept of multiplication; and addition or subtraction of decimals (in the context of money).

12 A class needs to earn 100 stars to have a pizza party. The class earned 27 stars in March and 32 stars in April. How many more stars does the class need to earn to have a pizza party?

Scoring Guide

Score	Description
1	Student has the correct answer, **41**.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

SCORE POINT 1
(EXAMPLE A)

⑫ A class needs to earn 100 stars to have a pizza party. The class earned 27 stars in March and 32 stars in April. How many more stars does the class need to earn to have a pizza party?

They need fourty-one more to win one.

Student's answer is correct.

SCORE POINT 1
(EXAMPLE B)

⑫ A class needs to earn 100 stars to have a pizza party. The class earned 27 stars in March and 32 stars in April. How many more stars does the class need to earn to have a pizza party?

Student's answer is correct.
(Showing work is not required.)

SCORE POINT 0
(EXAMPLE A)

⑫ A class needs to earn 100 stars to have a pizza party. The class earned 27 stars in March and 32 stars in April. How many more stars does the class need to earn to have a pizza party?

59 because

$$\begin{array}{r} 27 \\ +32 \\ \hline 59 \end{array}$$

Student's answer is incorrect.

SCORE POINT 0
(EXAMPLE B)

12 A class needs to earn 100 stars to have a pizza party. The class earned 27 stars in March and 32 stars in April. How many more stars does the class need to earn to have a pizza party?
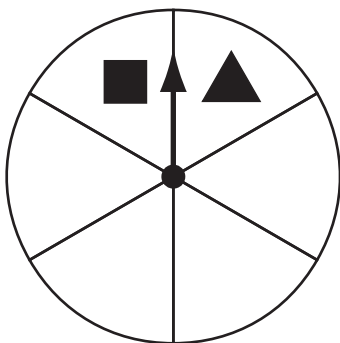
73

Because 73+27=100

Student's answer is incorrect.

DSP 3.5	**For a probability event in which the sample space may or may not contain equally likely outcomes, determines** the likelihood of the occurrence of an event (using "more likely", "less likely", or "equally likely").

❸ Look at this spinner.

Use ▲ and ■ to complete the four empty sections in the spinner so that the arrow is **most likely** to land on a ■.

Scoring Guide

Score	Description
1	Student completes the spinner to have more sections with a square than with any other symbol.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

⓭ Look at this spinner.

Student's response is correct.

Use ▲ and ■ to complete the four empty sections in the spinner so that the arrow is **most likely** to land on a ■.

SCORE POINT 1
(EXAMPLE B)

⓭ Look at this spinner.

Student's response is correct.

Use ▲ and ■ to complete the four empty sections in the spinner so that the arrow is **most likely** to land on a ■.

SCORE POINT 0
(EXAMPLE A)

⓭ Look at this spinner.

Student's response is incorrect.

Use ▲ and ■ to complete the four empty sections in the spinner so that the arrow is **most likely** to land on a ■.

SCORE POINT 0
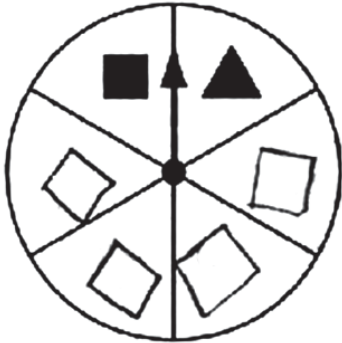**(EXAMPLE B)**

13 Look at this spinner.

Student's response is incorrect.

Use ▲ and ■ to complete the four empty sections in the spinner so that the arrow is **most likely** to land on a ■.
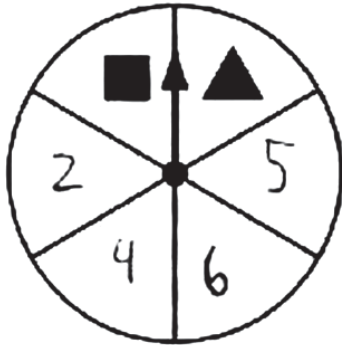

N&O 3.2   **Demonstrates understanding of the relative magnitude of numbers** <u>from 0 to 999</u> by ordering whole numbers; by comparing whole numbers to benchmark whole numbers (100, <u>250</u>, <u>500</u>, <u>or 750</u>); or by <u>comparing whole numbers to each other</u>; and <u>comparing or identifying equivalent positive fractional numbers</u> (*a*/2, *a*/3, *a*/4 where *a* is a whole number greater than 0 and less than or equal to the denominator) using models, number lines, or explanations.

⓮ Mary, Ed, Rob, and Lilly are all reading the same book. Last week,

- Mary read $\frac{1}{2}$ of the book,

- Ed read $\frac{2}{4}$ of the book,

- Rob read $\frac{1}{3}$ of the book, and

- Lilly read $\frac{2}{3}$ of the book.

a. Pick two people from this list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

b. Pick two other people from the list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Scoring Guide

Score	Description
2	Student provides two correct comparisons.
1	Student provides one correct comparison. OR Student provides one or more correct comparisons, but there is some additional incorrect information. OR Student shows minimal understanding of comparing fractions.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Responses:

Mary and Ed read the same amount.
Lilly read more than Rob.
Ed read less than Lilly.

SCORE POINT 2
(EXAMPLE A)

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14 Mary, Ed, Rob, and Lilly are all reading the same book. Last week,

- Mary read $\frac{1}{2}$ of the book,

- Ed read $\frac{2}{4}$ of the book,

- Rob read $\frac{1}{3}$ of the book, and

- Lilly read $\frac{2}{3}$ of the book.

a. Pick two people from this list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Mary read the same as E
Ed did $\frac{2}{4}$ because $\frac{1}{2}$ is the same
as

> a) Student's response is correct. (1 point)

b. Pick two other people from the list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Lilly read more than Rob
because $\frac{2}{3}$ is more than $\frac{1}{3}$.

> b) Student's response is correct. (1 point)

SCORE POINT 2
(EXAMPLE B)

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14 Mary, Ed, Rob, and Lilly are all reading the same book. Last week,

- Mary read $\frac{1}{2}$ of the book,

- Ed read $\frac{2}{4}$ of the book,

- Rob read $\frac{1}{3}$ of the book, and

- Lilly read $\frac{2}{3}$ of the book.

a. Pick two people from this list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Mary Read lessthen than lilly

a) Student's response is correct. (1 point)

b. Pick two other people from the list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Ed Read greater than Rob

b) Student's response is correct. (1 point)

29

SCORE POINT 1
(EXAMPLE A)

14 Mary, Ed, Rob, and Lilly are all reading the same book. Last week,

- Mary read $\frac{1}{2}$ of the book,

- Ed read $\frac{2}{4}$ of the book,

- Rob read $\frac{1}{3}$ of the book, and

- Lilly read $\frac{2}{3}$ of the book.

a. Pick two people from this list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Ed read $\frac{2}{4}$ of the book which is $\frac{4}{2}$ more than Mary has read.

> a) Student's response is incorrect. (0 points)

b. Pick two other people from the list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Rob read $\frac{1}{3}$ less than Lilly.

> b) Student's response is correct. (1 point)

SCORE POINT 0
(EXAMPLE A)

14 Mary, Ed, Rob, and Lilly are all reading the same book. Last week,

- Mary read $\frac{1}{2}$ of the book,

- Ed read $\frac{2}{4}$ of the book,

- Rob read $\frac{1}{3}$ of the book, and

- Lilly read $\frac{2}{3}$ of the book.

a. Pick two people from this list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Mary read less than Rob.

a) Student's response is incorrect. (0 points)

b. Pick two other people from the list. Write a sentence that compares how much these two people read. Use the words "more than," "less than," or "the same" in your sentence.

Ed read more then Lilly.

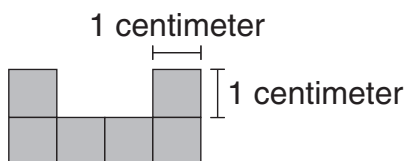b) Student's response is incorrect. (0 points)

| G&M 3.6 | **Demonstrates conceptual understanding of perimeter of** polygons, and **the area of** rectangles <u>on grids</u> using a variety of models or manipulatives. <u>Expresses all measures using appropriate units</u>. |

15 Look at this shape.

1 centimeter

1 centimeter

a. What is the perimeter of the shape?

_____ centimeters

b. Explain what perimeter means.

Scoring Guide

Score	Description
2	Student gives the correct perimeter, **14**, and correctly defines perimeter.
1	Student gives the correct perimeter. OR Student correctly defines perimeter.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:

Part b: Perimeter is the distance around a shape.

SCORE POINT 2
(EXAMPLE A)

⓯ Look at this shape.

1 centimeter

1 centimeter

a. What is the perimeter of the shape?

14
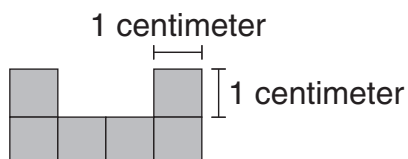
_____ centimeters

a) Student's answer is correct.

b. Explain what perimeter means.

Perimeter means
the distance around any
Shape.

b) Student correctly
defines perimeter. (1 point)

SCORE POINT 1
(EXAMPLE A)

15 Look at this shape.

1 centimeter
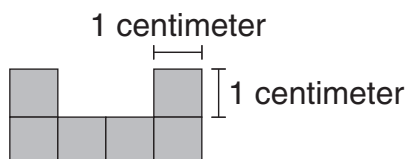
1 centimeter

a. What is the perimeter of the shape?

13 _____ centimeters

a) Student's answer is incorrect. (0 points)

b. Explain what perimeter means.

the perimeter means the Distens around an odge.

b) Student correctly defines perimeter. (1 point)

SCORE POINT 1
(EXAMPLE B)

⑮ Look at this shape.

1 centimeter

1 centimeter

a. What is the perimeter of the shape?

14
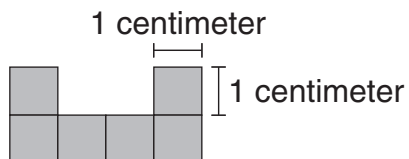
_____ centimeters

a) Student's answer is correct. (1 point)

b. Explain what perimeter means.

The Sides

b) Student's definition of perimeter is insufficient. (0 points)

SCORE POINT 0
(EXAMPLE A)

15 Look at this shape.

1 centimeter
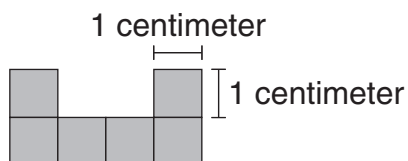
1 centimeter

a. What is the perimeter of the shape?

6

a) Student's answer is incorrect.
(0 points)

_____ centimeters

b. Explain what perimeter means.

Perimeter means out side
of a shape,

b) Student's definition of perimeter is
insufficient. (0 points)

F&A 3.1   **Identifies and extends to specific cases a variety of patterns** (linear and non-numeric) represented in models, tables, or sequences by extending the pattern to the next one, <u>two</u>, or <u>three elements</u>, or finding missing <u>elements</u>.

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16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

Money Earned
Walking Dogs

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	
12	
14	

a. Complete the table.

b. How much money will Holly earn if she walks 13 dogs?

Scoring Guide

Score	Description
2	Student has the correct answer, **$20.00, $24.00, and $28.00**, in part a and the correct answer, **$26.00**, in part b.
1	Student has the correct answer in part a. OR Student has the correct answer in part b. OR Student has the correct answer in part b based on an incorrect answer in part a.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Note: Give credit for answers without dollar notation.

SCORE POINT 2
(EXAMPLE A)

16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

Money Earned
Walking Dogs

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	
12	
14	

a. Complete the table.

$20.00
$24.00
$28.00

> a) Student's answer is correct.
> (1 point)

b. How much money will Holly earn if she walks 13 dogs?

$26.00

> b) Student's answer is correct.
> (1 point)

16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

**Money Earned
Walking Dogs**

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	20.00
12	24.00
14	2800

a) Student's answer is correct.
(1 point)

a. Complete the table.

3 would be six

b. How much money will Holly earn if she walks 13 dogs?

13 would be 26.00

b) Student's answer is correct.
(1 point)

SCORE POINT 1
(EXAMPLE A)

16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

Money Earned Walking Dogs

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	$20.00
12	$24.00
14	$28.00

a) Student's answer is correct. (1 point)

a. Complete the table.

4, 8, 12, 16, 20, 24, 28, 32, 36, 40
2, 4, 6, 8, 10, 12, 14, 16, 18, 20

b. How much money will Holly earn if she walks 13 dogs?

$52.00

b) Student's answer is incorrect. (0 points)

41

SCORE POINT 1
(EXAMPLE B)

16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

Money Earned
Walking Dogs

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	
12	
14	

a. Complete the table.

10 | $18.00

12 | $22.00

14 | $26.00

> a) Student's answer is incorrect.
> (0 points)

b. How much money will Holly earn if she walks 13 dogs?

$24.00

> b) Student's answer is correct based on incorrect answer in part a.
> (1 point)

SCORE POINT 0
(EXAMPLE A)

16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

Money Earned Walking Dogs

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	$20.00
12	$22.00
14	$26.00

a. Complete the table.

a) Student's answer is incorrect. (0 points)

b. How much money will Holly earn if she walks 13 dogs?

22 dollars

b) Student's answer is incorrect, and answer is also incorrect based on answer in part a. (0 points)

SCORE POINT 0
(EXAMPLE B)

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16 Holly started this table to show how much money she earns walking dogs. Holly always earns the same amount of money for each dog she walks.

Money Earned Walking Dogs

Number of Dogs Walked	Money Earned
2	$ 4.00
4	$ 8.00
6	$12.00
8	$16.00
10	22.00
12	$28.00
14	$34.00

a. Complete the table.

a) Student's answer is incorrect. (0 points)

b. How much money will Holly earn if she walks 13 dogs?

$25.00

b) Student's answer is incorrect, and answer is also incorrect based on answer in part a. (0 points)